ISSUES FACING GEORGIA'S REPTILES AND AMPHIBIANS AND RECOMMENDATIONS FOR NEW POLICIES

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ABSTRACT

Georgia is home to an abundance of reptile and amphibian species. There are very few laws protecting the two taxa from competition and predation by exotic species, habitat loss and fragmentation, unregulated harvest and collection for the food and pet trades. Limited life and natural history information is another reason for species declines. The existing laws protecting herpetofauna in the state of Georgia are not enforced and are open to broad interpretation. Special interest groups such as Partners for Amphibian and Reptile Conservation (PARC) and others lobby for laws to protect native reptiles and amphibians from leading factors of decline, but more funding must be allocated towards conservation of herpetofauna. Educational programs must be developed and utilized to teach the public about reptile and amphibian declines and conservation. Habitat accrual and proper management are important for preservation of native herpetofauna. Research on laws and recommendations is essential for conservation and protection.

Keywords: herpetofauna, habitat fragmentation, unregulated harvest, isolated wetland, Clean Water Act Section 404, BIO-SAFE, ecotype, equity, efficiency

The southeastern United States has the highest reptile and amphibian biodiversity in the country. Georgia is home to 41 species of snakes, 28 species of turtles, 15 species of lizards (2 of which are not native), 1 species of crocodilian, and 1 species of amphisbaenid—a rare and fossorial reptile also known as a worm lizard. The state boasts even greater amphibian diversity with 54 species of salamanders and 31 species of frogs and toads (1 species of frog is not native). The salamander diversity in the southeastern US is the greatest in the world and is certainly something to be valued and protected. The great amounts of diversity are attributed to the varied geographic regions throughout the state (Gibbons and Jensen 2004). Georgia is composed of unique geography including the Blue Ridge Escarpment of the southern Appalachian Mountains, Ridge and Valley limestone regions, sandhills, Okefenokee Swamp, barrier islands and other coastal land, and an abundance of other distinct habitats (netstate.com n.d.).

Many of Georgia's reptile and amphibian populations are being threatened daily by issues such as competition and predation by exotic species, habitat loss and fragmentation, unregulated harvest and collection for the food and pet trades, and limited life and natural history information about many of the species. However, it is not only Georgia herpetofauna that is imperiled; this is a worldwide issue that must be confronted and resolved (Cheater n.d.). Laws regarding each of these issues must be developed and enforced to ensure the survival of Georgia herpetofauna.

The introduction of non-native species is a serious problem. Currently, Georgia has no statutes and regulations regarding the introduction of non-native species of reptiles and amphibians (J. Jensen, pers. comm. 2006). Exotic species sometimes outcompete native species and cause declines in native populations (Magalheas et al. 2005). Some species are accidentally introduced by industries such as landscaping, while others are pets that are intentionally released because the owner no longer wants to take responsibility for the animal (Kormas and Caraco 2003). An example of the problems that ecosystems face when exotic species are introduced is the devastation the Florida Everglades is now experiencing from the introduction of Reticulated and other python species.

Partners in Amphibian and Reptile Conservation (PARC) has created a protocol containing a series of guidelines that address the different issues affecting herpetofauna and procedures for management of exotic herpetofauna. PARC recommends a list of exotic species that might be introduced into the wild in the state of Georgia —along with characteristics used to identify those species—be compiled. The organization also recommends breeders and sellers of non-native species be familiar with the exotic species' common and scientific name, animal husbandry pertinent to the species, and the proper ways of disposing of the animal when the caretaker no longer wants the animal. The option to euthanize the animal is a better solution than releasing it into the wild when it is no longer wanted. In addition, the suggested standards ask that the seller possess documentation proving the legal status of the exotic species' origin and abide by standards for humanely keeping the species (NEPARC n.d.).

PARC's recommendations are not only reasonable, but are also feasible. The introduction of non-native species can be halted or reduced with outreach programs and regulations prohibiting release of exotics into natural ecosystems.

Turtle and amphibian species are being lost at an alarming rate because of the devastation of isolated wetlands and surrounding areas. Recently the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) formulated new strategies that instruct field technicians to be more conservative when classifying types of wetlands and waterways that they propose for protection by the Clean Water Act (CWA) (Nickens n.d.). The EPA and Corps had to revise their method of classifying wetlands and waterways when they were challenged by two different groups—the Solid

Waste Agency of Northern Cook County (SWANCC) and a group of Michigan developers (Rapanos et al. and Carabell et al.).

SWANCC, comprised of a group of metropolitan areas in Illinois, took the Corps to lower courts after being denied a CWA Section 404 permit for discharging fill material into an isolated wetland (*Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers*, 531 U.S. 159 [2001]). A CWA Section 404 permit is required to discharge any dredged or fill substance into United States government waters (Whitlock and Carlin, 2006). The Corps denied the permit because over 100 species of birds were documented to inhabit the wetland. The case made it to the Supreme Court in 2001 and the court ruled that the EPA and Corps does not have the authority to regulate wetlands if the wetland is not adjacent to a navigable body of water (*Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers*, 531 U.S. 159 [2001]).

In 2006, another Supreme Court decision changed the ways in which wetlands and tributaries are classified. A group of Michigan developers—led by John Rapanos and June and Keith Carabell—once again challenged the Corps' jurisdiction over isolated wetlands. The Supreme Court decided the EPA and Corps will continue to assert jurisdiction over traditional navigable waters (TNWs) and wetlands adjacent to TNWs. However, the EPA and Corps will not regulate wetlands with a small or insignificant connection to TNWs. In addition, the two agencies will have to conduct a more thorough assessment when determining the scope of the CWA Section 404 jurisdiction (*Rapanos v. United States Army Corps of Engineers*, 547 U.S. 715 [2006], *Carabell v. United States Army Corps of Engineers*, 547 U.S. ___ [2006]).

Due to the SWANCC and Rapanos decisions the Corps recent recommendations lower the maximum size for emergent wetlands from 4.0 ha to 1.2 ha. Although, studies have shown that wetlands, no matter how small, can sustain and support huge populations of species (Semlitsch and Bodie 1998). A study conducted over a 16-year period at Rainbow Bay, a 0.5-ha Carolina bay on the Savannah River Site (Semlitsch et al. 1996) documented utilization of the wetland by 41,776 female frogs and salamanders, 216,215 metamorphosing frogs and salamanders, and use by 27 different species of frogs and salamanders. Both Corps and EPA sources are currently unclear about the new guidelines for classifying wetlands. However, in early 2008 the Corps and EPA created a multi-page form for employees to use in the field to determine wetland delineation. The form has a series of "yes"/"no" and short answer questions created to help employees determine Corps jurisdiction over wetlands (P. Holland, pers. comm., 2008).

Many species of reptiles and amphibians are dependent upon isolated wetlands and will lose an important requirement in their life cycle if these habitats are lost. Currently, there is no regulation or protection for isolated wetlands in Georgia. Not only is it crucial that these wetlands achieve protection status, but they must also have a relatively undisturbed upland area of at least 150 m around them to protect the terrestrial stages of wetland-

dependent herpetofauna (J. Jensen, pers. comm., 2005). In 2001, a group of Dutch scientists developed an assessment program that evaluates the habitat biodiversity and suitability before and after alteration based on ecological, political, and legal criteria; this program is called BIO-SAFE. The program was developed as a management device to recognize the interests of urban developers as well as conservationists. BIO-SAFE is a model for quantification of political and legal values concerning biodiversity in quantitative terms and compare those values for different species, ecotypes and management scenarios (Lenders et al. 2001). Ecotypes are spatial units homogenous in vegetation, succession, structure and other factors relevant to plant growth (Klijn and Udo de Heas, 1994). Ecotypes are useful to engineers, ecologists and landscape designers in planning and management (Lenders et al. 2001). The BIO-SAFE method was tested in 2006 to determine the effectiveness of the model to assess actual and potential values of floodplains and ecotypes in north-Western Europe. The study found that BIO-SAFE is useful in assessing management impacts on protected or endangered species (De Nooij et al. 2006). BIO-SAFE has been successful in attaining results beneficial to wildlife communities; therefore a similar program is recommended for development and implementation in Georgia.

In addition, new programs and policies should be formulated to increase funding for management, land purchase, and incentive programs. More habitat containing wetlands, sandhills, and other unique ecosystems is needed for successful management, and to accomplish this, more funding is needed. New policies should focus on habitat accrual.

Unregulated harvest and collection is another major issue contributing to the declines of reptiles and amphibians. Georgia law allows the "taking of non-game species." GA. CODE ANN. § 27-1-28 (2007). The law allows harvest of 14 different groups of animals, the "unlucky 14", including freshwater turtles, poisonous snakes, frogs and spring lizards… On 7 May 2002, a group of wildlife biologists from the Georgia Department of Natural Resources Wildlife Resources Division, the Georgia Herpetological Society, and the Savannah River Ecology Laboratory, known as the Herp Laws and Regulations Reform Team (HLRRT), met to discuss and recommend law reform measures that will better protect reptiles and amphibians in Georgia. They came up with a set of regulations protecting herpetofauna divided into two categories: personal and commercial use (HLRRT 2002).

Currently there are virtually no laws protecting herpetofauna from collection for personal use. The only groups protected are native, nonvenomous snakes and all species listed as endangered, threatened, rare, or unusual (J Jensen, pers. comm., 2005). Personal use is vaguely described as the use of animals for meat and skin. Personal use guidelines recommended by the HLRRT regarding the collection of reptiles limits each individual to a maximum of two of each species. In addition, reptiles collected for personal use cannot be sold. If the two collected reptile individuals produce offspring, then the offspring must either be euthanized, given away as a gift, or donated to the

Department of Natural Resources within the twelve-month period following hatching or birth. The owner must keep documentation of the date of and number of individuals at hatching/birth and recipients of the hatchlings/young. The HLRRT developed these rules modeled after rules of the Arizona Game and Fish Committee, which has been successful in its efforts to limit collection of native reptile and amphibian species. Collection of reptiles found on the collector's private property should require a hunting license. If the individuals are taken on a Wildlife Management Area (WMA), then the collector must also purchase a WMA stamp. Personal use guidelines regarding amphibians limit collecting to a maximum of 10 individuals per species. As with reptiles, amphibians collected for personal use cannot be sold. In addition, the same standards regarding the licenses needed and offspring of reptiles apply to amphibians (HLRRT 2002).

The existing Georgia commercial laws allow venomous snakes, freshwater turtles, and salamanders to be collected without regulation. The only exception applies to those listed as endangered, threatened, rare, or unusual (J. Jensen, pers. comm. 2005). The HLRRT recommends that commercial use of venomous snakes continue to be allowed, but collectors must obtain a hunting permit and collectors with the intention of selling the skins of the snakes must also obtain a fur, hide, and pelt license (HLRRT 2002). The regulations are reasonable and an improvement over present laws; however because of the vulnerability of many populations of venomous snakes, a bag limit should be created and strictly enforced. A bag limit on venomous snakes will slow the efforts of people interested in conducting rattlesnake round-ups, which are detrimental to populations (Arena et al. 1995). The HLRRT (2002) recommends that turtles be exempt from commercial collecting because of their vulnerability. They are exploited for the pet trade and shipped in mass quantities to other countries that value their meat. No commercial collection of reptiles or amphibians may be collected on public lands under the HLRRT guidelines (2002).

The commercial regulations recommended by the group for amphibians are much more lenient. Commercial collection is allowed and is unregulated for common amphibian species by this group. Common amphibian species are bullfrogs, dusky salamanders, green frogs, bronze frogs, pig frogs, river frogs, and leopard frogs (HLRRT 2002). The amphibian regulations for commercial collection are too lenient. The passenger pigeon was once one of the most abundant bird species in the eastern US; however, unregulated collection for commercial use quickly led to its extinction (Allen 1968).

Lack of knowledge of reptiles and amphibians has led to negative stigmas associated with some of the members of the two taxa. Snakes are generally feared and persecuted because they are commonly viewed as dangerous and harmful, while most people have never seen or heard of a salamander. Currently, there are no policies regarding reptile and amphibian education. Many state agencies such as the Department of Natural Resources and societies such as the University of Georgia Herpetological Society perform outreach

programs on herpetology for little or no cost. However, these programs are conducted only when an interested person schedules them for a class or group. Georgia elementary, middle and high school curriculum should require teachers to include wildlife in their curriculum and lesson plans. Children are fascinated by wildlife—especially snakes—and teaching them at an early age will help to dispel the negative associations related to herpetofauna.

Limited funding for scientific studies conducted on reptiles and amphibians is also to blame for the lack of information. More funding should be allocated to research life and natural history characteristics as well as management plans so that reptile and amphibian species can be better understood and managed.

Equity and efficiency are justification for creating regulations regarding all issues concerning native Georgia reptiles and amphibians. Humans have an ethical obligation to protect native species in an effort to preserve ecosystems and ensure the survival of the species. Efficiency is another justification because the loss or decrease in reptile and amphibian populations is a market failure, and the government must create policies that will prevent or compensate for these losses.

Tools for successfully implementing this policy are incentives, government regulations, and provision of educational services by organizations such as the Department of Natural Resources. Incentives are needed for private landowners to protect reptile and amphibian habitat, or to allow the state to manage the lands for them.

Special interest groups and individuals with funding for lobbying are instrumental in the support or lack of support of new policies. Private landowners—especially in the southeastern US—conservation agencies, developers, agriculture groups, and other businesses have more resources and are very influential on policy formulation. Therefore, herpetologists, state agencies, and other conservation groups should create an outreach program specifically designed to educate these groups.

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